

Workshop
Economic Evaluation
of Transmission
Expansion

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Workshop Objective

Educational

- High level understanding of production cost models and use for transmission planning
inputs, outputs, and assumptions
- Interpretation of economic study results

Western System Modeling Status and Improvements

- Understanding modeling limitations
- Identification of needed modeling improvements

Transmission Planning Concepts: colors

- Blackouts – Reliability Planning
- Brownouts - Adequacy Planning
- Red Ink – Economic Planning

Workshop will concentrate on Economic Planning related to Transmission in the West

Reliability Planning

- **Principle focus of Reliability Planning is on maintaining a reliable system – “keep the lights on”**
 - Identification of expansion or operating changes needed to prevent Blackouts and Cascading Outages
 - Expansion to meet Reliability Standards at lowest expansion costs
- **Uses models that simulate system physics (Power Flow, Transient Stability, other)**
 - To predict physical performance
 - Frequency and duration of outages for likely contingencies
- **Individual Utilities and Subregional Planning Groups (SPG) typically perform reliability Planning**
- **WECC develops reliability standards and measurements, monitors reliability performance, provides data for reliability studies, coordinates reliability planning and operations studies, determines transmission path capacities.**
- **May use Production Costing program tools to develop approximate future system dispatch patterns and operation that can then be tested for reliability performance**

Adequacy Planning

- **Principle focus is on system adequacy to meet load**
 - Concerned about amount and location of generation to meet load requirements and the transmission that connects.
 - Is there enough to prevent shortages and Brownouts “at any cost”.
- **Uses models that tabulate L&R balance, transmission capacity, and probability studies to evaluate:**
 - Adequate resource levels to cover loads under likely conditions
 - Resource Reserve Margins
 - Loss of Load probabilities
 - Adequate connecting transmission capacity
- **WECC and CREPC (WRATS) currently taking the lead on resource adequacy evaluation in the West**
- **May use Production Cost models to provide approximate system dispatch and L&R patterns for future system scenarios that can then be tested for adequacy.**

Economic Planning

- **Principle focus of Economic (Expansion) Planning is on expansion to meet commercial needs of the market place.**
- **Uses models to determine if there is cost effective transmission needed to**
 - Allow efficient operation of the present or future system
 - Assure economic delivery of low cost resources to customers
 - Prevent price volatility and help insure reasonable prices
 - Facilitate appropriate performance of commercial and market structures
- **Uses Production Cost program model and tools to simulate economic performance of the system in order to:**
 - Evaluate the economic effect of system additions
 - Predict price and cost differences at locations on the system
 - Predict amounts and costs of congestion on system
 - Model performance of market and commercial structures
- **Individual Utilities, SSG-WI and the SPGs perform economic planning**
- **SSG-WI Database maintenance and administration currently performed by Pacificorp. This role likely to transfer to WECC in the near future.**

SSG-WI Study Program

- **SSG-WI 2003 Study Report was filed with FERC in October 2003**
- **SSG-WI studied the transmission effects of 3 resource scenarios in 2003**
- **SSG-WI plans to study the transmission effects of a “realistic” resource scenario in 2004-05 and recommend specific additions.**
- **Additions will be submitted to the WGA as “tests” of the Transmission Permitting Protocol and to facilitate the WGA Transmission Financing discussions**
- **SSG-WI found the stakeholder process a valuable way to obtain resource input to the study program.**
- **A process has been established in the West for performing regional planning studies, involving SSG-WI, WECC and the Subregional Planning Groups (SWAT, RMATS, STEP, and the CCPG)**